

(21) Application No 8312843

(22) Date of filing 10 May 1983

(30) Priority data

(31) 8213998

8217095

8219266

8228449

8228708

(32) 13 May 1982

11 Jun 1982

2 Jul 1982

5 Oct 1982

7 Oct 1982

(33) United Kingdom (GB)

(43) Application published

4 Jan 1984

(51) INT CL³

B65D 33/36

(52) Domestic classification

B8K 2K1 2K8 2M FC

U15 1105 B8K

(56) Documents cited

GB A 2079723

GB A 2000744

GB 1295834

GB 1104359

EP A 0007685

US 0458190

(58) Field of search

B8K

(71) Applicants

Mars Limited,

(United Kingdom),

143-149 Fenchurch

Street,

London EC3M 6BN.

(72) Inventors

Berry Seward,

Paul Woolman,

Kevin Christopher Pope,

Digby Ralphs Redshaw,

Malcolm Brian Hastings,

Malcolm Douglas,

Norman Withnall.

(74) Agent and/or Address for

Service

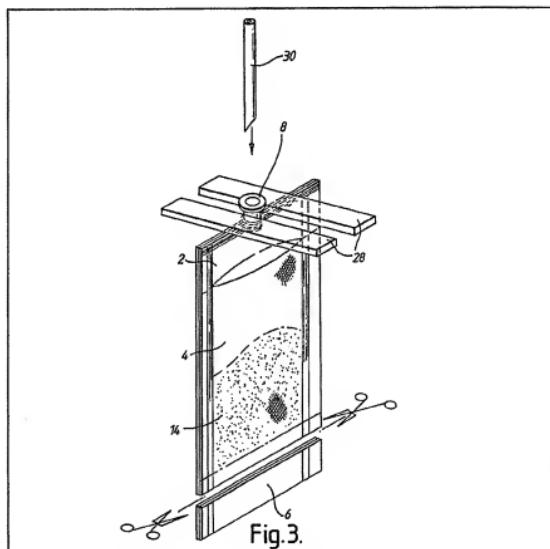
Carpmaels and Ransford,

43 Bloomsbury Square,

London WC1A 2RA.

(54) Beverage dispensing

(57) A sealed beverage package which in use is opened and the contents mixed with an aqueous medium to provide a beverage comprises locating means 8 for locating an aqueous medium introducing means such as a hollow needle 30. The package is in sachet form and comprises an air- and water-impermeable sheet material 2 with the locating means in the form of a nozzle 8 sealed in an edge seam. The sachet may enclose a filter sheet material 4 enclosing ground coffee 14. The filter material 4 stops short of the bottom edge of the sachet. In use the bottom of the sachet is cut open, and the nozzle 8 pierced by needle 30. Water is introduced into the sachet, infuses with the ground coffee and the beverage is released from the opening in the sachet bottom.



GB 2 121 762 A

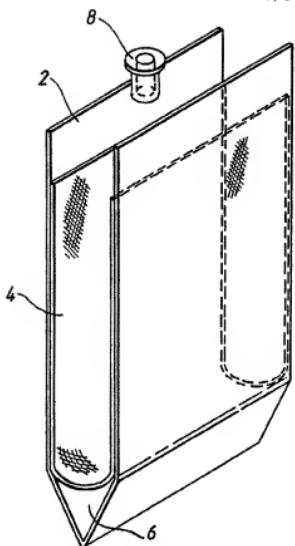


Fig.1.

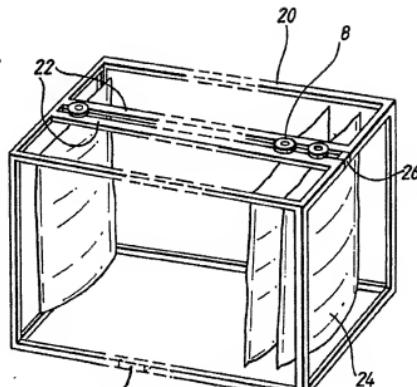
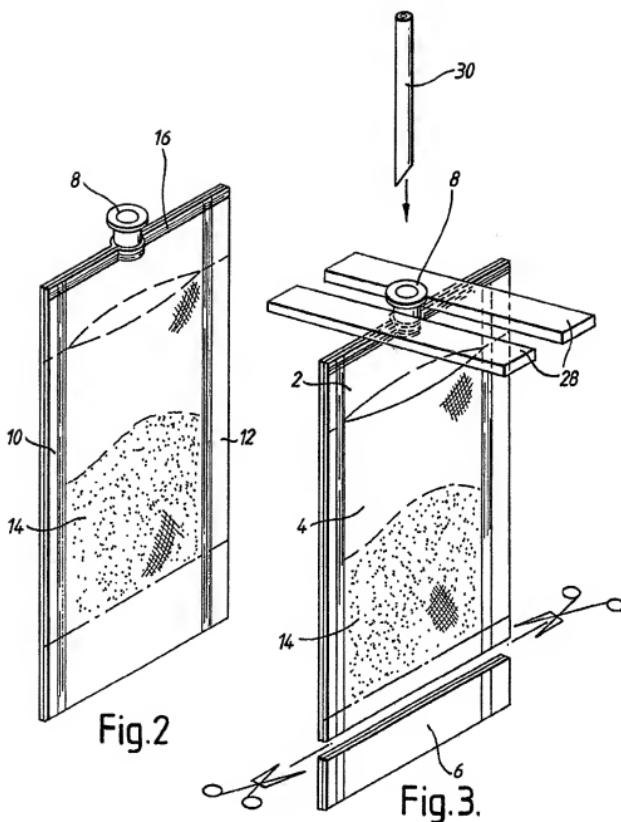


Fig.4.

POOR QUALITY



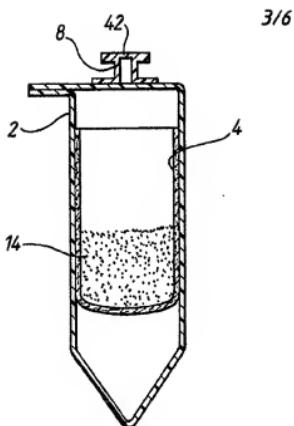


Fig. 5.

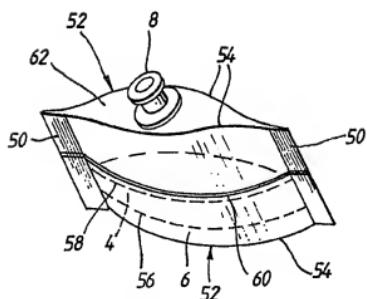


Fig. 6.

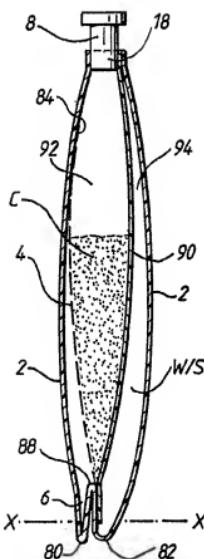


Fig. 7.

4/6

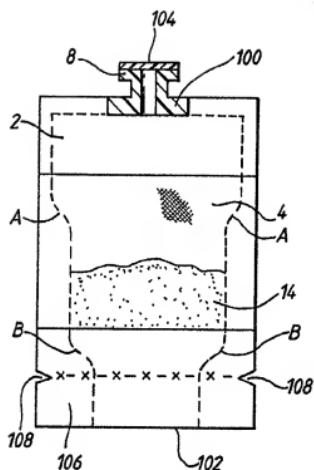


Fig.8.

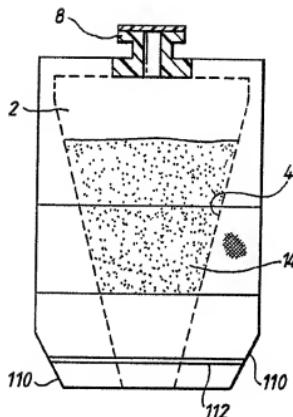


Fig.9.

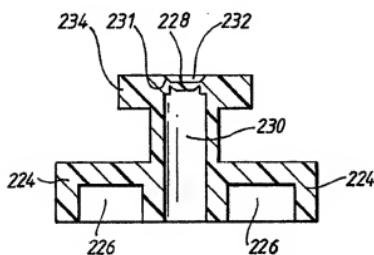


Fig.12.

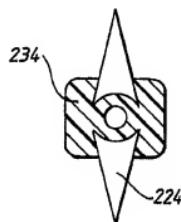
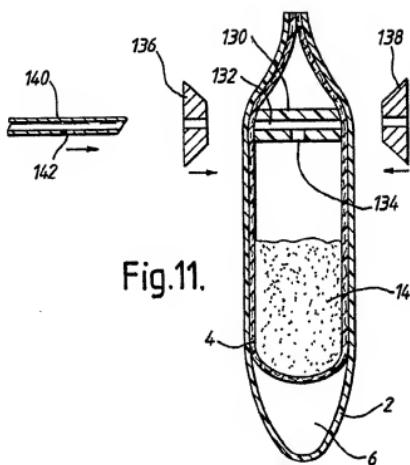
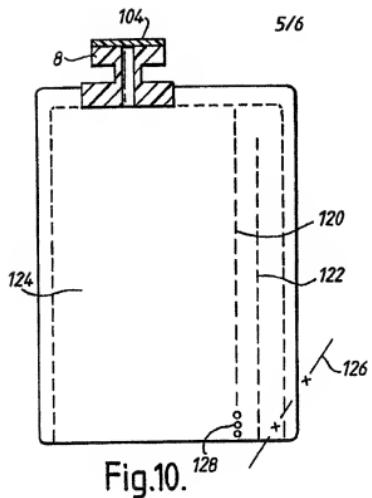


Fig.13.



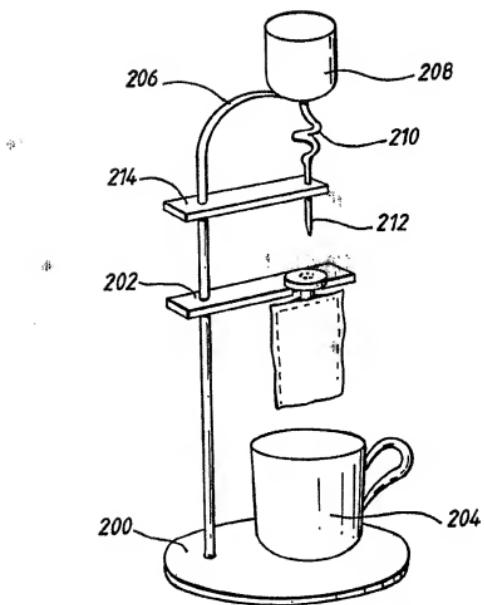


Fig.14.

SPECIFICATION

Beverage dispensing

5 This invention relates to beverage dispensing and particularly, but not exclusively, to the production and dispensing of fresh brewed beverages such as coffee and tea.

Over the years, a number of different systems 10 have been proposed for freshly brewing coffee and tea. These generally involve some form of filtration to separate the coffee grounds or tea leaves from the beverage for drinking, and preferably some form of sealed packaging to keep the coffee or tea fresh prior 15 to use.

The idea of sealing fresh coffee or tea in individual packages of an air-impermeable material with a filter material therein is not new. The package is only 20 opened at the time of use, water is introduced thereto and the extracted liquid removed, with the 25 coffee grounds or tea leaves retained by the filter material. The package is then discarded.

Several problems exist with dispensing of coffee or tea from such packages, especially where they are 25 intended for use in beverage dispensing machines.

We have identified several areas of difficulty in 30 handling such packages efficiently. One of these can be termed the water introduction area - the mechanism whereby the package is opened and water introduced. In some past proposals, it has been intended that the top of the package be cut open, and 35 water fed in under gravity. Not only does this provide unpredictability with filtration time and a variable brew from package to package, but it can be slow (leading to a cold drink). It can also be 40 unhygienic in that, say, coffee grounds can froth out over the top of the package.

Another difficulty is in efficiently handling packages in a beverage dispensing machine. For several 45 reasons, typically hygiene, it is desirable that some degree of automation be provided between package introduction, beverage dispensing, and package disposal. This dictates an efficient mechanism for mechanically handling such packages.

45 A further problem is obtaining accurate dispensing of the beverage from the package into a container such as a jug or cup without sputtering and the production of unnecessary dripping.

We have now developed beverage packages to 50 enable these, and other difficulties to be solved.

One development we have devised is the application of a separate water introduction means onto the package (such as a nozzle entered by a water introducing hollow needle), and also a means which 55 acts as a device enabling the sachet to be machine-handled. These two means may be combined.

Magazines consisting of pluralities of such packages may be loaded into a suitable beverage dispensing machine. The individual packages may be extracted 60 one by one from the magazine as and when required for use. They may be moved through the machine, through the various stages required in order to extract a drink, by mechanisms cooperating at least with the machine-locating means. If desired, spent 65 packages may be reloaded into an empty magazine

which is conveniently disposed of when full. Alternatively, magazines of packages may be held in a dispenser separate from the beverage dispensing machine.

70 According to a first aspect of the invention there is provided a sealed beverage package formed of substantially air- and water-impermeable material containing a product for providing a beverage when contacted with an aqueous medium, the package

75 comprising separately-formed locating means for positively locating aqueous medium-introducing means in sealing engagement with the package, whereby aqueous medium may be introduced into the package, contacted with said product and a beverage extracted from the package through outlet means made in the package in use.

According to a second aspect of the invention there is provided a magazine comprising a plurality of the said sealed beverage packages according to 80 the invention.

According to a third aspect of the invention there is provided a rigid nozzle, for use in a said sealed beverage package according to the invention, as the aqueous medium introducing locating means.

90 According to a fourth aspect of the invention there is provided a method of providing a beverage which comprises providing a sealed beverage package according to the invention, placing the package at an aqueous medium introducing station with an

95 aqueous medium introducing means located in communication with the locating means of the package, introducing aqueous medium into the package, and extracting a beverage from the package after contact of the aqueous medium with the 100 beverage providing product, an outlet having being formed in the sealed package either before or whilst the package is at the aqueous medium introducing station.

According to a fifth aspect of the invention there is provided a beverage dispensing apparatus for providing a beverage from a beverage package according to the invention which comprises an aqueous medium-introducing means, and means for enabling the locating means of the package to cooperate with 105 the aqueous medium introducing means.

The locating means is preferably a rigid element having at least one passageway formed there for engagement by the aqueous medium introducing means. The rigid element may be tubular, and may 110 be formed from a suitable plastics material.

The locating means may be secured partly within and partly outside the package, for example in a seam of the package, or alternatively secured to the outside of the package, or in a yet further alternative,

120 the locating means may be completely within the package, for example secured to an interior wall of the package. The package and the locating means may be supplied separately where the locating means is to be secured to the outside of the package.

125 The package may be of a flexible plastics material in the form of a sachet.

The package may further comprise means for enabling the package to be located positively at one or more stations in a beverage dispensing machine,

130 and the aqueous introducing locating means end

machines locating means may be separate or combined in the same element.

The package may have a water-permeable filter therein for filtering the beverage after the contact with the beverage providing product, or if filtration is not necessary, the filter may be omitted.

As a further alternative to a rigid element, the locating means may comprise a deformable element, for example, a ring of elastic material, secured 10 to the outside or inside of the package and adapted to be sealingly engaged by the aqueous medium introducing means.

The beverage dispensing apparatus may have mechanical means for engaging the aqueous medium introducing means in the locating means, and may have mechanical means for handling packages. The apparatus may have means for forming an outlet in a package.

Preferred features of the invention will now be 20 described with reference to the accompanying drawings, given by way of example, wherein:-

Figures 1, 2 and 3 are perspective views of a sealed beverage package in the form of a sachet according to a first embodiment of the invention; in 25 manufacture (Figure 1), in final form (Figure 2), and in use (Figure 3);

Figure 4 is a perspective view showing a magazine containing a plurality of the Figure 2 sachets;

Figure 5 is a side cross-sectional view through a 30 sachet according to a second embodiment of the invention;

Figure 6 is a perspective view of a sachet according to a third embodiment of the invention;

Figure 7 is a side cross-sectional view of a sachet 35 according to a fourth embodiment of the invention;

Figures 8, 9 and 10 are front cross-sectional views of sachets according to fifth, sixth, and seventh 40 embodiments of the invention;

Figure 11 is a side cross-sectional view of a sachet 45 according to an eighth embodiment of the invention and showing its use schematically;.

Figure 12 is a side cross-sectional view of a nozzle for use in sachets of the invention;

Figure 13 is a plan view of a further nozzle for use 50 in sachets of the invention; and

Figure 14 is a perspective view of a simple beverage dispensing apparatus according to the 55 invention.

In the various Figures, like reference numerals are 60 occasionally employed for like components.

Refer to Figures 1, 2 and 3. Figure 1 shows the partially-assembled sachet. A layer of substantially air- and water-impermeable sheet material 2 is provided. Such material is typically a barrier layer 65 laminate consisting of layers of plastics materials and metallised layers adhered together. Many such laminates are known in the art, and the presently illustrated example employs an aluminium metallised polyester layer laminated to polypropylene, with the aluminium metallisation juxtaposed between the polyester and polypropylene layers. The polypropylene layer is innermost.

Inside such sheet material 2 is disposed a layer of 70 filter sheet material 4 of a type and porosity suited to the purposes of filtering coffee from coffee grounds.

This may be a filter paper or a non-paper product such as spun-bonded polypropylene sheet material. The filter material extends the width of sheet material 2 but stops short at the top end and

traverses (but does not extend into) a V-shaped bottom region 6 of material 2. A plastics nozzle 8 having a cylindrical delivery channel closed by a plastics flashing thereacross is disposed at the top of material 2.

75 *Figure 2* shows the completed sachet. The side edges are heat sealed together at 10, 12; the inner plastics layer of material 2 and the filter material 4 fuse together in the heating area to seal materials 2 and 4 at such edges.

80 Freshly-ground coffee 14 sufficient for an individual cup of coffee is loaded into the package formed by materials 2, 4. Loading may be vertically through a tube, not shown, from a supply of such material. The top edges 16 of material 2 are then

85 heat sealed so as to seal opposing faces together and to the plastics nozzle 8. The filling and sealing may be accomplished under inert gas so that the sealed sachet thus formed contains coffee packaged to the exclusion of oxygen. The sachet of *Figure 2* is 90 ready for loading in a magazine or dispenser with similar such sachets for subsequent use in a beverage dispensing machine.

Figure 3 illustrates schematically the manner in which a beverage is extracted from a selected 95 sachet. As shown, the sachet has been removed from its storage area, such as a magazine, and, supported by rails 28 within the machine, is held at a beverage dispensing station. The bottom of the sachet is severed or pierced (shown schematically

100 by means of a pair of knives) below the fold in the filter material 4, in the area provided by the V-shaped region 6 of material 2. A hollow needle 30 is inserted into nozzle 8, severing the flashing across the delivery channel thereof. Hot water is injected, preferably under moderate pressure, through needle 30 into the sachet, and coffee runs from the bottom thereof into a cup (not shown). The coffee grounds are retained by the filter paper 4. The needle is removed from the nozzle 8 and the sachet discarded.

110 *Figure 4* illustrates a magazine 20 formed of a frame having a pair of parallel top rails 22. The sachets 24 are loaded within the magazine and supported positively therein with the nozzles 8 located slidingly between rails 22, the top flanges of

115 the nozzles being supported on the rails 22. For use in a beverage dispensing machine, an end bar 26 closing one end of the space between rails 22 is snapped off and the magazine inserted into an appropriately shaped magazine-receiving chamber

120 of the machine. Single sachets may then be extracted mechanically from the magazine and handled in the machine with guidance to the relevant dispensing positions provided by mechanisms cooperating with the nozzle 8. To assist in correct 125 location of the magazine in the machine, slots 27 cooperate with corresponding latches on the machine.

It is not necessary that the magazine be adapted for insertion in the beverage dispensing machine or 130 that the sachets be mechanically removed. For

example, it may be desired to provide a dispenser for sachets separate from the beverage dispensing machine, which dispenser accommodates magazines of sachets. The user would remove a sachet 5 from the sachet dispenser and insert it in the beverage dispensing machine.

Figure 5 illustrates a second embodiment of the invention wherein a base flange 40 of nozzle 8 is attached to sheet material 2 (e.g. by ultrasonic or 10 heat welding, by adhesive techniques or by use of a pop-stud technique) so as to be on the outer surface of the sachet. The nozzle could be on the side of the sachet, but if it is desired to place it on the top thereof, a further fold 41 and sealing of the upper- 15 most edges of sheet material 2 at one side will provide the appropriate result as shown in Figure 5.

Although in the Figure 5 embodiment the sheet material 2 maintains the barrier to air ingress through nozzle 8 prior to use, it may still be desirable 20 to retain the thin flashing (shown at 42) to exclude dust from the nozzle delivery channel prior to use. In this example, it will be apparent that, in use, needle 30 must pierce sheet material 2 to introduce water to the sachet.

Figure 6 illustrates a further sachet according to the invention. In this embodiment the sheet material is brought together and adhered at side edge seams 50. Top and bottom seams 52 are formed by folds 54. The filter sheet material 4 extends between the side 30 edge seams 50 and includes a bottom fold 56. Top edges 58 of sheet material 4 are adhered to the adjacent faces of sheet material 2 to prevent coffee falling down the gap there-between into region 6 (from where it could drop into the user's cup when a 35 beverage is extracted from the sachet). The sachet is also closed along one major side face by a horizontal edge seam 60. The nozzle 8 is ultrasonically welded to a top area 62 of the sachet.

One aspect of the invention concerns the mixing of 40 various beverage-producing components within the sachet. For example, with coffee, there are generally four accepted alternative beverages: black or white coffee with or without sugar. Although it is clearly possible to mix all ingredients required (e.g. 45 coffee, and/or whitener, and/or sugar) in one pocket of a sachet, this might not be desirable since freshly-ground coffee may not store and brew well in contact with these other ingredients. It is possible to avoid this problem by adding these optional ingredients to the cup of brewed black coffee separately, but it might also be desirable to avoid this since it could complicate machine dispensation.

Figure 7 shows an alternative sachet according to the invention for dealing with this problem.

Referring to Figure 7, the sheet material 2 is provided with a pair of bottom folds 80, 82, the filter material 4 extends from one side face of material 2, to which it is adhered, at 84. The lower end of material 4 adheres to a side face of a centre bottom 60 fold 88 of material 2. A further sheet 90 of the substantially air- and water-impermeable sheet material extends from the adhesion area on the side face of fold 88 upwardly to the top edge of the sachet. Thus constructed the sachet consists of two 65 substantially air- and water-impermeable compart-

ments 92, 94, one of which, 92 is further divided by the sheet material 4 isolating a sub-compartment into which ground coffee is held - at C. This sub-compartment is isolated from the two bottom 70 folds 80, 82. Whitener and sugar W/S are held in compartment 94.

In use the sachet is severed or pierced along the line X-X and water introduced through nozzle 8. Coffee is extracted from the ground coffee C and is 75 filtered and deposited in a suitable receiving container as in previous embodiments, whereas the whitener and sugar W/S is deposited from the sachet into the receiving container for mixing therein.

A further possible arrangement for keeping beverage-producing components separate until use, although not illustrated, consists of a sachet similar to that of Figure 2, but with a heat- or pressure-sensitive seal extending horizontally across the sachet a distance from the bottom thereof. This 85 provides two chambers, one which can be employed for ground coffee or leaf tea and the other for the second component, e.g. whitener and/or sugar. The ground coffee or leaf tea would be retained within the filter material, but it is optional whether 90 the other component is so retained or whether it exists below the lowest level of the filter material. In use, the action of injecting water into the sachet ruptures the horizontal seal to enable both components to be dispensed from the sachet when opened 95 at the base.

Although it is convenient to employ the nozzle on the sachet, as described, both for the function of machine handling and for location of a water-introduction means, this is not essential. For example, a separate pin may be located on the package for the purpose of machine handling, and the nozzle employed just for location of the water-introduction means.

A further beverage sachet according to the invention is illustrated in Figure 8. The nozzle 8 is of moulded polypropylene, and has sidewards-extending fins 100 sealed to the edges of the substantially air- and water-impermeable sheet material 2. These fins are also shown in plan view in the Figure 13 nozzle embodiment as integers 224. The edge sealing of the sheet material 2 is shown by dotted lines, terminating at a bottom edge fold 102. The opening through nozzle 8 in the sachet is closed with a layer 104, which may be for instance, 110 of the same material as the air- and water-impermeable sheet material 2.

In use, the sachet is designed to have its base opened (to allow the beverage to escape after brewing) by means of the user tearing off a lower 120 strip 106. To assist in this operation two edge nicks 108 are provided in the sachet. Other means for enabling the user to open the base easily may be provided: e.g. peelable tabs, tear strings or tear strips.

125 The edge sealing extending downwardly of the sachet moves inwardly at two steps A and B so that the orifice provided at the base is substantially less than the full width of the sachet. This arrangement whereby the cross-section presented to the brewing 130 liquid decreases down the sachet has proved to be of

advantage in that it provides a deeper coffee bed and a more reproducible standard of beverage. The smaller orifice also reduces the area from which spluttering of the beverage, as it leaves the sachet, 5 occurs and provides a better directional flow of liquid.

The decrease in cross-section may be discontinuous as illustrated in Figure 8, or continuous as shown in Figure 9. The latter shows a sachet similar 10 to that of Figure 8 except that the seal extends downwardly in a continuous taper. Tapering provides not only a deeper coffee bed for infusion but an improved cross-section of orifice at the base. The orifice being narrow, tends to form an ellipse rather 15 than pucker and close - as occurs with wider flexible openings. The Figure 9 sachet also has its lower corners removed at 110. Some liquid can occasionally drip from the lower corner edges. By bringing these corners closer together any such liquid fails 20 from a more localised area and is more likely to fall into the beverage-receiving container. The sachet of Figure 9 is also provided with a peelable tear strip 112 to enable the user to open the sachet base with ease.

25 In sachets such as illustrated in Figures 1 to 8 the filter sheet material 2 is of greater height than the height of ground coffee it contains. In some instances, it has been found that water entering the sachet can bypass the coffee by passing through the 30 higher levels of the filter sheet material. This can lead to irreproducibility in the standard of beverage provided. The effect may be overcome by reducing the height of the filter sheet material such that it is completely covered by coffee. Such an arrangement 35 is shown in Figure 9: the coffee 14 extending to a greater height in the sachet than the filter sheet material 4.

The prime purpose of such sachets as described is to provide an improved freshly-brewed product, 40 particularly of coffee or tea, as opposed to the production of a beverage from a water-soluble or water-dispersible forerunner. However, one main area where it is envisaged such sachets will be employed is in beverage vending machines, especially those designed to offer a choice of different beverages from a range stored in the machine. In such instances, it is unlikely that all the beverages will be infused-type products, and the beverage-providing materials might by syrups, liquids, or 45 water-dispersible or water-soluble powders. Examples are fruit drinks (orange, lemon etc.) soups, chocolate drinks. In the case of water-dispersible or water-soluble powders, it may be of advantage to filter the beverage prior to dispensation, but this is 50 by no means essential and is unlikely to be practical for syrups - which might soak the filter material prior to use.

The present invention contemplates the omission 55 of the filter material from the sealed beverage packages, the result being packages providing a non-infused beverage. The filter material may be simply omitted from the sachets as described but a design particularly suited for such use is illustrated in Figure 10.

60 Referring to Figure 10, the sachet has a pair of

generally-vertically extending spaced apart seals 120 and 122. A chamber 124 to the left of seals 120, 122 retains the beverage-providing product (not shown). Apertures at the bottom of seal 120 and at the top of seal 122 enable liquid to escape from chamber 124 from the bottom right-hand corner of the sachet when opened along line 126. The expelled liquid passes up and down the two channels formed by seals 120, 122 and the right-hand edge seal of the 75 sachet. The arrangement shown increases the dissolution or dispersion of the product in the injected liquid (in the chamber 124) prior to being expelled from the sachet.

It may be of additional advantage to provide a 80 temporary seal 128 at the foot of seal 120. In the absence of a filter material this will retain the beverage-providing product in the chamber 124. The temporary seal 128 may be of a pressure- or heat-sensitive material which is ruptured when the beverage is expelled from the sachet.

Further embodiment of the sachet is shown in Figure 11. The general construction of the sachet is as already described with the exception of the nozzle 8. In place of nozzle 8 and enclosed within the sachet 90 is a cylindrical element 130 of rigid material such as a suitable plastics material having a passageway 132 extending through it, parallel to the longitudinal axis of the cylinder. A central portion of the element 130 is cut away to allow a central outlet 134 from the 95 passageway 132 into the sachet.

In use, the locating element 130 is clamped between annular clamps 136 and 138 being part of an apparatus for holding the sachet. A tubular water-introducing needle 140 pierces the walls of the 100 sachet and is located such that a water outlet 142 of the needle register with the outlet 134 from the passageway 132 of the locating element 130. In this way, water can be introduced into the sachet to contact the coffee 14 to produce a beverage - which 105 can be removed from sachet by opening the sachet at region 6. The element 130 may be adhered positively to the sachet, or held in position in, for instance, in a corner seam.

A further alternative to the water-introduction 110 locating means could be a ring of deformable elastic material secured to the material of the sachet. The ring could be secured either inside or outside the sachet and, in use, a needle, for example of the type shown in Figure 11, for introducing water, would 115 pierce the sachet and seal against the ring. The ring may be annular, with a central orifice against which the needle seals, or in the form of a complete disc which would itself be split by the water introducing needle. The water-introduction locating means could 120 be deformable but non-elastic, for example, by having a variety of movable plates in a similar way to an iris-type camera shutter. Furthermore, the locating means could have some means such as a screw thread or bayonet fitting to lock a water introducing 125 injector in position.

Although a nozzle 8 such as described is desirably moulded from a plastics material such as polypropylene, the latter has the disadvantage that, even when quite thick, it does not have as good barrier properties as that of the sheet material 2. Simply

providing a thin flashing, such as at 228 in Figure 12 - see later, may not be acceptable for long-term storage purposes. This can be accommodated in a variety of ways. For example, a layer of barrier sheet 5 material (e.g. of the same material as material 2) may be disposed across the base of the nozzle, obturating the lower end of the water-introduction channel (230 in Figure 12) and which would be pierced by the water injector. Alternatively, the water 10 introduction channel may be closed with a press-fitted plug of suitable barrier properties and which is pushed out (into the sachet) by the water injector.

The sealed beverage packages so far specifically exemplified are formed as flexible sachets. This in 15 itself is not essential and the packages may be, at least in part, rigid. For example, the package may have a rigid cylindrical side wall with a base and roof formed of flexible sheet material. A water introduction locating means is attached to the roof. The base 20 would be pierced to enable the beverage to be removed. Alternatively, a rigid roof may be employed in combination with flexible sidewalls.

Nozzles for use with sealed beverage packages such as the sachets shown in Figures 1 to 10 will now 25 be described. Preferably the nozzles have side fins (110 in Figure 8) to provide a large area for sealing and adhesion to the sheet material 2.

Two forms of nozzle for use on sealed beverage packages are shown in Figures 12 and 13, respectively.

Referring to Figure 12, which shows a moulded polypropylene nozzle similar to that in Figures 8 to 10, sidewards-extending fin 224 are moulded with recesses 226 which help reduce the sink-in effect of the polypropylene which occurs after moulding and as the material cools and contracts. Sink-in can 35 distort the side surfaces of fins 224 and reduce the effectiveness with which the surfaces of the fins seal to the air- and water-impermeable sheet material 2. The nozzle is also provided with a flashing 228 moulded across the water delivery channel 230, recessed at 232 so that the latter provides a positive 40 location position for the water injector of the beverage dispensing apparatus. The flashing 228 breaks 45 from the nozzle when the water injector is inserted. The lip 231 of the breakaway portion is slightly 50 smaller in diameter than the water injector so as to seal against the latter. A similar sealing effect for the nozzle with the injector may be provided in several 55 other ways, for example, by tapering the water delivery channel 230.

Although the top flange 234 of the nozzle may be continuous, it may be desirable to manufacture it with a discontinuous flange, as shown in Figure 13. In plan view in the latter Figure (where the top surface of the discontinuous flange is shaded to enable better comprehension of the drawing), there is no overlap of any of the component parts, and this enables a simpler and cheaper moulding tool to be 60 employed.

Although the invention contemplates use of the sealed beverage packages in a beverage dispensing machine where some, if not all, of the actions essential to obtain a beverage are accomplished 65 automatically, this is not essential.

To obtain a beverage from, for instance, a sachet such as in Figure 2, the apparatus may be as simple as shown in Figure 14. This comprises a stand 200 having a first arm 202 with an arcuate slot into which

70 the barrel of a sachet nozzle 8 may be clipped, with the sachet suspended above a cup 204. (The slot is concealed by the nozzle in Figure 14). A second arm 206 supports a water-receiving bowl 208 which leads through a flexible tube 210 to a water-introduction 75 hollow needle 212, the latter being supported on a third arm 214 slidable vertically.

In use, the cup 204 is placed on the stand 200, the bottom is cut off the sachet, and the latter clipped onto arm 202. The arm 214 is lowered to enable 80 needle 212 to pierce and enter the sachet nozzle. Hot water is poured into bowl 208 and the beverage collected in cup 204. Such an apparatus is sufficiently simple for domestic use.

For certain beverage-providing products, such as 85 leaf tea, the degree of air- and water-impermeability needed for material 2 need not be as high as that needed, for example for ground coffee whose freshness is much more air- and water-sensitive. The term "substantially air- and water-impermeable material" 90 is therefore intended to cover such variations. It is also possible to distribute the barrier properties between, for example, the material 2 and an outer wrapper.

The term "sealed beverage package" is intended 95 to cover a package which itself is sealed or a package in which the beverage outlet is already formed at the place of manufacture and which package is enclosed in an air- and water-impermeable wrapper which may then be removed by the user.

100 CLAIMS

1. A sealed beverage package formed of substantially air- and water-impermeable material containing a product for providing a beverage when contacted with an aqueous medium, the package comprising separately-formed locating means for positively locating aqueous medium-introducing means in sealing engagement with the package,

110 whereby aqueous medium may be introduced into the package contacted with said product and a beverage extracted from the package through outlet means made in the package in use.

2. A package according to claim 1 wherein the 115 locating means is a rigid element having at least one passageway formed therein for engagement by the aqueous medium introducing means.

3. A package according to claim 2 wherein the rigid element is a nozzle extending exteriorly of the 120 package.

4. A package according to claim 3 wherein the nozzle has a flange to enable the package to be supported thereby.

5. A package according to claim 4 wherein the 125 nozzle has a top flange to enable the package to be supported thereby and a lower flange for sealing engagement to said package.

6. A package according to claim 2 wherein the rigid element is tubular and located within the 130 package.

7. A package according to claim 1 wherein the locating means comprises a deformable element.

8. A package according to claim 7 wherein the deformable element is of elastic material adapted to be sealingly engaged in use by aqueous medium introducing means.

9. A package according to any of claims 1 to 8 when, excluding the locating means, at least in part flexible.

10. A package according to claim 9 wherein the air- and water-impermeable material is a flexible sheet material.

11. A package according to claim 10 when in the form of a generally-planar sachet.

12. A package according to any of claims 1 to 11 which includes a filter material within the air- and water-impermeable sheet material.

13. A package according to claim 12 wherein the filter material is a sheet material.

14. A package according to claim 13 wherein the cross-sectional area presented to the aqueous medium introduced through the locating means decreases on passage to the opening made in the package in use.

15. A package according to claim 14 wherein the cross-sectional area is a continuous reduction in the direction of said opening.

16. A package according to any of claims 12 to 15, wherein the full area of filter material exposed in use to the aqueous medium is in contact with the beverage-providing product.

17. A package according to any of claims 12 to 16, wherein the air- and water-impermeable material extends beyond the filter material in a direction remote from the locating means whereby a chamber is formed below a region where the filter material supports the beverage-providing product, which chamber in use is opened to enable the beverage to be extracted from the package.

18. A package according to any of claims 1 to 17 wherein means are provided to assist in opening the package.

19. A package according to claim 18 wherein the assisting means comprises a tear strip or peelable strip.

20. A package according to any of claims 1 to 19 comprising separate compartments containing separate components for the beverage which are only mixed to form the beverage at the time of use.

21. A package according to claim 20 comprising a filter material in association with one compartment so that the component therein/aqueous medium mixture is filtered in use.

22. A package according to any of claims 1 to 21 wherein a filter material is within the air- and water-impermeable material and the beverage providing product is ground coffee or leaf tea.

23. A sealed beverage infusion sachet formed of substantially air- and water-impermeable sheet material enclosing a filter sheet material supporting ground coffee or leaf tea, a sealed nozzle extending outwardly from the substantially air- and water-impermeable sheet material at or adjacent the top of the sachet, the substantially air- and water-impermeable sheet material extending downwardly from said nozzle, below the lowest level to which the filter sheet material extends, to an outlet area such that, when the nozzle seal is broken and aqueous medium introduced into the package and the package opened at the outlet area aqueous medium contacts the ground coffee or leaf tea, passes through the filter material and leaves the outlet area as coffee or tea beverage.

24. A magazine which comprises a plurality of the sealed beverage packages each as claimed in any of claims 1 to 23, each package being retained positively in the magazine by magazine-locating means.

25. A magazine according to claim 24 wherein the magazine-locating means is the aqueous medium introducing locating means.

26. A magazine according to claim 24 or 25 which includes means to locate the magazine positively at a dispensing station of a dispenser for said packages.

27. A magazine according to claim 26 wherein said dispenser is an integral part of a beverage dispensing machine.

28. A rigid nozzle for use in a sealed beverage package as claimed in claim 1 as the aqueous medium introducing locating means.

29. A nozzle according to claim 28 comprising a bore to enable aqueous medium to be introduced into the package, a first flange for cooperating with the aqueous medium introducing means and a second flange for attaching the nozzle to the package.

30. A nozzle according to claim 29 wherein the second flange comprises an opposed pair of side-wardly-extending and outwardly-tapering fins.

31. A nozzle according to claim 29 or 30 wherein the bore is obturated by a substantially air- and water-impermeable material.

32. A nozzle according to claim 31 wherein said material is a sheet material extending across said bore.

33. A method of providing a beverage which comprises providing a sealed beverage package as claimed in any of claims 1 to 23, placing the package at an aqueous medium introducing station with an aqueous medium introducing station with an aqueous medium introducing means located in communication with the locating means of the package, introducing aqueous medium into the package, and extracting a beverage from the package after contact of the aqueous medium with the beverage providing product, an outlet having been formed in the sealed package either before or whilst the package is at the aqueous medium introducing station.

34. A method according to claim 33 wherein the package is severed or pierced to enable the beverage to be extracted.

35. A method according to claim 33 wherein a tear strip is removed from the package to enable the beverage to be extracted.

36. A beverage dispensing apparatus for providing a beverage from a beverage package as claimed in any of claims 1 to 23, which comprises an aqueous medium introducing means, and means for enabling

the locating means of the package to cooperate with the aqueous medium introducing means.

37. An apparatus according to claim 36 wherein the aqueous medium introducing means comprises a hollow injector through which said medium is introduced into the package.

38. An apparatus according to claim 37 wherein the injector is movable into and out of association with the locating means.

10 39. An apparatus according to claim 36, 37 or 38 wherein the enabling means comprises means to support the aqueous medium introducing locating means whereby the package is supported in the apparatus.

15 40. An apparatus according to any of claims 36 to 39 which includes means to form an outlet in the package.

41. An apparatus according to any of claims 36 to 40 when adapted to receive a magazine comprising a plurality of said packages and for extracting individual packages from the magazine.

20 42. A sealed beverage package substantially as hereinbefore described with reference to Figures 2, 5, 6, 7, 8, 9, 10 or 11 of the accompanying drawings.

25 43. A magazine comprising a plurality of sealed beverage packages and substantially as hereinbefore described with reference to Figure 4 of the accompanying drawings.

44. A rigid nozzle for use in a sealed beverage 30 package substantially as hereinbefore described with reference to Figure 12 or 13 of the accompanying drawings.

45. A beverage dispensing apparatus substantially as hereinbefore described with reference to Figure 14 of the accompanying drawings.

Printed for Her Majesty's Stationery Office, by Croydon Printing Company Limited, Croydon, Surrey, 1984.
Published by The Patent Office, 26 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.